

**Figure 1: Genomic constitution of certain Brassica species (U, 1935).
Amphidiploids listed in bold text**

	Brassica rapa	
	Diploid	
	Genome - AA	
Brassica napus	Brassica juncea	
Amphidiploid	Amphidiploid	
Genome - AACC	Genome - AABB	
Brassica oleraceae		Brassica nigra
Diploid		Diploid
Genome - CC		Genome - BB
	Brassica carinata	
	Amphidiploid	
	Genome - BBCC	

2/3

Figure 2: Breeding procedure used to develop herbicide tolerant

Brassica juncea

Females

Male

Bulk population from
 16 Brassica juncea breeding lines
 low glucosinolate (9-18 umoles)
 low erucic acid (<1%)

46A72

Crossed to produce the F1

Female

Males

F1 from previous cross
 13 F1 lines x 15 plants per line
 Selected with Pursuit® 50ml/ha a.i.
 Chose resistant plants for crossing

Bulk pollen from 16 breeding lines –
 F5 to F8 generation
 low glucosinolate (<8 um)
 low erucic acid (< 0.5%)

Crossed to produce BC1

Female

Males

BC1 populations from previous cross
 6 BC1 populations x 36 plants per line
 Selected with Pursuit® - 50 ml/ha a.i.
 Chose resistant plants for crossing

Bulk pollen from 16 breeding lines –
 F5 to F8 generation
 low glucosinolate (<8 umoles)
 low erucic acid (<0.5%)

Crossed to produce BC2

Female

Males

BC2 seed from previous cross
 4 BC populations
 Selected with Pursuit® – 50 ml /ha a.i.
 Chose resistant plants for crossing

Bulk pollen from 3 breeding lines –
 F6 generation
 low glucosinolate (6 to 12 umoles)
 low erucic acid (<0.5%)

Crossed to produce BC3

Stable juncea phenotype combined with Pursuit® tolerance
 Lines coded: 98SJ-23841, 98SJ-23844, 98SJ-23845

**Figure 3: Greenhouse and field evaluation of Herbicide tolerant
Brassica juncea populations**

Greenhouse evaluation 1 – verify tolerance and juncea phenotype

98SJ-23841, 98SJ-23844, 98SJ-23845 and unstable BC3 sister lines planted for herbicide tolerance evaluation

Pursuit® applied at 50 ml/ha a.i.; juncea phenotype stable

Survivors self pollinated and harvested

Greenhouse evaluation 2 – verify tolerance and juncea phenotype

Survivors from previous project planted for herbicide tolerance evaluation

Pursuit® applied at 50 ml/ha a.i.; juncea phenotype and tolerance stable in 98SJ-23841, 98SJ-23844 and 98SJ-23845

Survivors self pollinated and harvested

Field evaluation 1 – verify tolerance and juncea phenotype under field conditions

Pioneer Hi-Bred International Puerto Vallarta Mexico Research Station

Self-pollinated selections from all other previous projects were planted at a single location

Odyssey® was applied at 30g/ha a.i.

Juncea phenotype stable – tolerance present in 98SJ-23841, 98SJ-23844 and 98SJ-23845 progenies

Other material derived from other generations and breeding lines exhibited a range of tolerance ranging from fully resistant, intermediate resistant and susceptible. Plant phenotypes ranged from full Brassica napus to Brassica juncea phenotypes and lines and populations that exhibited traits that were intermediate between Brassica napus and Brassica juncea. In these other materials, full resistance to the herbicide was not associated with the juncea phenotype, and vice-versa.